

INTRODUCTION

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In recent decades, the formation of the concept of race in the late eighteenth and early nineteenth centuries has attracted much scholarly interest particularly in the history of science, philosophy, and literary studies. At the same time, the naturalization of gender differences, which went hand in hand with the emerging life sciences, has been widely studied and criticized. However, the concept of race and the naturalized, scientific understanding of gender have rarely been studied in relation to each other, although their co-emergence is not just a question of simultaneity. At the end of the eighteenth century, the two ideas play a central role in the process of the temporalization of nature and the emergence of the life sciences. In particular, scientific understandings of race and gender are constituted and disputed within the debates on procreation, generation, and heredity that take place during the period. *Race and gender*¹ are thus closely connected to the new focus on diachronic processes of propagation and on long-term successions of individuals, which—in the second half of the eighteenth century—came to be articulated by the neologism *reproduction*.² However, the fact that concepts of race and gender co-emerged within the “procreation discourse” (Jocelyn Holland) of the late eighteenth century does not mean that they did so in parallel or homologous ways. On the contrary, connections between *race*, *gender*, and *reproduction*, which were of central importance for population politics later in the nineteenth century, were dispersed and unstable during the period.

The aim of this volume is to inquire into processes of the co-emergence of the concepts of race, gender, and reproduction in the decades around 1800—a period when all these concepts were in the making. To explore both continuities and discontinuities with subsequent biopolitical discourses,

the volume examines specific configurations of biological and philosophical knowledge within their cultural and political contexts at the beginning of modernity. Philosophical discourse is a main focus of this inquiry because of its paramount influence in shaping the emerging field of the life sciences and because philosophy itself was reshaped in this process. The volume therefore not only contributes to a contextualist understanding of the life sciences, but also questions a modern, purified understanding of philosophical discourse by resituating it in the scientific and cultural contexts within which it emerged.

When, in the course of the eighteenth century, philosophers and scientists started to question the mechanistic understanding of nature and to identify a particular realm of nature where mechanic laws did not—or at least not sufficiently—apply, they envisaged “another world,” as Charles Bonnet put it, “a new spectacle” (Abraham Trembley), or “a new nature” (Pierre-Louis Moreau de Maupertuis).³ The capacities to reproduce, or self-generate and self-organize, soon became the crucial characteristics of the natural entities that belonged to this new realm of “living” nature. As Kant famously pointed out in the second part of the *Critique of Judgment*, an “organized being,” which must be regarded as *Naturzweck* (natural purpose), is characterized by the fact that it is “of itself” cause and effect.⁴ Kant gives the example of a tree, which is defined by its capacities of reproduction, growth, and regeneration or self-preservation.⁵ In a certain sense, the whole enterprise of the temporalization of nature builds on the concept of reproduction, that is, on an understanding of procreation and generation that takes into account temporal change, the emergence of something new, and thus moves away from preformationism and the idea that, at creation, God formed the “germs” of all living beings, which from then on only have to be “unfolded.” In short, *life*—the term that becomes the conceptual center of the new science named *biology*—is “that which produces, grows, and reproduces,” as Michel Foucault has put it.⁶

In this epistemic context, ideas of race and gender underwent far-reaching changes as both became situated in and defined by the early life sciences. On the one hand, the scientific interest in processes of reproduction went hand in hand with disputes about the role of the sexes in propagation and culture in general. On the other hand, inquiries into human variation were increasingly concerned with processes of race-mixing, crossbreeding, and hereditary transmission of parental traits. Although “critical attention to early race theory” has for a long time focused on debates concerning monogenism

and polygenism, Stefani Engelstein suggests that “the paradigm shift in reproductive theory . . . from preformation to epigenesis” is at least “equally important for the constitution of modern race discourse.”⁷ As scholars like Claudia Honegger and Londa Schiebinger have shown, it was just these “scientificalized” understandings of race and gender that played a prominent role in the period’s political and ethical debates on equality and inequality, freedom and nonfreedom.⁸

The terms *race* and *sex* were in use long before the late eighteenth and early nineteenth century. In the case of *race*, François Bernier is said to have been the first to use the term as a way of distinguishing global populations in his *Nouvelle Division de la Terre, par les différentes Espèces ou Races d’hommes qui l’habitent* (New Division of the Earth, According to the Different Species or Races of Men who Inhabit It), published in 1684. However, as the title already suggests, Bernier did not distinguish between *races* and *species*. Rather, he used both terms in a broad sense to designate certain groups of human populations. This was also the case for Linnaeus and Buffon, who, if they used the term at all, did so unsystematically. As is now widely known, it was Immanuel Kant who first gave a definition of race that was to powerfully impact not only contemporary debates but also those of the subsequent centuries. Kant, as Robert Bernasconi puts it, not only gave a definition, but “set a direction for further inquiries.”⁹ Specifically, he did two things. First, he introduced the concept of race as a crucial term for his project of a genealogically oriented natural history, and thus as one that contributed to overcoming the classificatory, static forms of knowledge about nature, which Kant called *Naturbeschreibung* (natural description). In “the description of nature,” he writes, “only the comparison of marks matters. What is here called *kind* [*Art*] is often only called *race* there,”¹⁰ where “there” refers to *Naturgeschichte* (natural history) as Kant understands it. For Kant, then, the term *race* only functions within the new form of knowledge of nature, which deals with developments and genealogies instead of taxonomies. Second, and in accordance with this, Kant linked race to the concept of heredity. His definition is:

Among the subspecies, i.e., the hereditary differences of the animals which belong to a single phylum, those which persistently preserve themselves in all transplantings (transpositions to other regions) over prolonged generations among themselves and which also always beget half-breed young in the mixing with other variations of the same phylum are called *races*.¹¹

Interestingly, with this definition Kant also rearticulated the concept of heredity. As Staffan Müller-Wille and Hans Jörg Rheinberger have pointed out, “the way Kant set up the problem and the way he advanced a solution can be regarded as prototypical for the emergence of heredity.”¹² Until then, *heredity* had mainly been used in a juridical sense with research and reflections on hereditary diseases as the exception.¹³ With Kant’s new articulation, however, the term came to designate intergenerational transmissions of bodily traits resulting from reproduction.

In a similar way, ideas of sex and gender underwent significant change in this period. In the German-speaking lands, the term *Geschlecht* had long been used in a genealogical sense, designating kinship groups like large families or dynasties. Toward the end of the eighteenth century, however, its meaning became more and more restricted, so that *Geschlecht* came to refer mainly to the sexes. The German dictionary *Zedlers Universal-Lexikon* from 1735, for example, only refers to the genealogical meaning but not to sexual difference in any natural-historical or biological sense—in clear contrast to dictionaries from the early nineteenth century.¹⁴ Thus only when social change and the politics of equality—most obviously in women’s activism and criticism during the French Revolution—undermined traditional gender arrangements and hierarchies, the bodily differences between women and men became the object of a new cultural concern. The emerging life sciences, physical anthropology, and in particular comparative anatomy thereby played an important role in the invention of modern gender polarizations and a naturalized, scientific understanding of gender that absorbed and legitimated cultural assumptions about difference and hierarchy.

However, a polarized, hierarchical understanding of gender developed only around 1800. As Peter Hanns Reill has shown in his comprehensive analysis of Enlightened vitalism,¹⁵ mid-century theories of reproduction only occasionally referred to the different roles and functions of the sexes and their reproductive organs. When these were mentioned, as for example in Maupeituis’s work, it was to stress the equal contribution of both sexes to the process of procreation and generation, contesting both the ovarist and the animalculist versions of preformationism, which argued for the preexistence of the individual in either the ovum or the sperm.¹⁶ Even Johann Friedrich Blumenbach’s concept of the *Bildungstrieb* (formative drive), which proved so important for the formation of a “science of life” because it allowed “the systematic level of the organization of an individual” to be linked with “the order of living nature,”¹⁷ did not account for sexual difference. The *Bildungstrieb* in Blumenbach’s sense was a homogeneous drive active in all living beings

in the processes of structuring nutrition, generation, and regeneration. This view would change in the years to come. When Friedrich Wilhelm Joseph Schelling, in his philosophy of nature, adopted Blumenbach's concept, he added the idea that the drive "separates into opposing tendencies," male and female.¹⁸ Like Kant's definition of race, this sexualization of the *Bildungstrieb* took on central importance for subsequent scientific theories and political-ethical discourse alike. However, as Peter Hanns Reill, Florence Vienne, and Alison Stone argue in this volume, the cultural process of the "polarization" and "differentiation" of the sexes was not a linear development; rather, during the period, both one-sex and two-sex models overlapped as they were favored by different authors.¹⁹

Though the invention and rearticulation of *race* and *gender* at the turn of the century was by no means a merely intellectual project, the fact that philosophy and the early life sciences were involved in this process cannot be underestimated. Indeed, the interplay of these fields of knowledge contributed much to the cultural significance that the concepts of race and gender would eventually gain. In the decades around 1800, philosophies of nature, including German *Naturphilosophie*, were closely tied to the scientific debates and developments of the day. As historian of science Dietrich von Engelhardt notes,

All the key philosophers of the time thought about the relation of man to nature and the possibilities of knowledge about nature to an extent that has never been matched since then. In addition, though not to the same extent, naturalists around 1800 grappled directly with the conceptions of *Naturphilosophie*.²⁰

At this point, neither the life sciences nor philosophy had clear disciplinary demarcations; they were, precisely, emerging fields of knowledge. In certain respects it seems that they shaped one another and benefited mutually from the cultural credit each gained in this period. Speaking of *Naturphilosophie* was thus "perceived as offering natural history a rise in status from a mere appendage of the medical faculty to full membership alongside mathematics, philology, and physics in a higher philosophical faculty."²¹ The avoidance of philosophy by natural scientists only arose later in the nineteenth century, when biology had become established as a natural science. In contrast to biology, philosophy had been institutionalized as a distinct field of knowledge for centuries. Yet this institutionalization, and accordingly the cultural understanding of philosophy, also changed significantly around 1800. In the

medieval arrangement of disciplines that prevailed in higher education in Germany until the end of the eighteenth century, philosophy was regarded as a mere preliminary “to the higher studies in one of the credentialed professions, theology, law or medicine.”²² This subaltern position of the philosophical faculty was, however, highly contested in the disputes of the 1790s that led to the Prussian academic reform. This reform, in which most of the protagonists of what became known as *classical* German philosophy were involved, transformed the philosophical faculty “into a full-fledged higher faculty, claiming to teach the most advanced subjects, and with autonomy from the restrictions formerly imposed by the theologians.”²³ Thus, in the decades around 1800, both philosophy and the life sciences were in the making and—in this process of emergence—closely interrelated. The disciplinary borders that were established in the course of the nineteenth century and the gulf that was later thought to separate the natural sciences from the humanities and social sciences did not yet exist.

Neither did the idea of nature as entirely separated from the social or the cultural. With respect to the emerging concepts of race, gender, and reproduction, which were to become main points of reference for the biopolitical discourses of the nineteenth, twentieth, and even twenty-first centuries,²⁴ this meant that the way in which scientific and political-ethical meanings of these concepts intersected in the period differed considerably from their later articulations. As Lorraine Daston has argued, “naturalization” as a discursive process in which social, political, and cultural ideas are projected into nature was by no means new at the end of the eighteenth century. On the contrary, the “moral authority of nature” could be and was interpellated in various ways, as Daston and Fernando Vidal show by using examples from different periods and societies.²⁵ However, “where conceptions of nature diverge, so do the strategies . . . of naturalization,”²⁶ and this was certainly the case in the late eighteenth century. According to Emma Spary, the new mode of naturalization can be traced back to Buffon. At least “the appeal to a ‘nature’ existing beyond society, but forming the bedrock of social interactions and moral aesthetic standards, was what many readers particularly perceived in Buffon, even if there was little consensus on his political or religious views.”²⁷ A specific form of naturalization was thus appearing on the horizon, to which later forms of “scientific racism,” biological articulations of gender differences and various forms of population policy could refer, even if the configurations of the late eighteenth and early nineteenth century clearly differ from the later forms of biological determinism that presuppose a sharp distinction between the social and the natural.

From the mid-nineteenth century onward, the idea that sex and race are biological givens indicating cultural and social status and that these concepts—along with those of the child, the criminal, and the insane—can be treated as analogies, became common currency, as the relentless repetition of these ideas shows.²⁸ However, in the period between 1750 and 1830, which is the focus of this volume, a scientific understanding of race, a dichotomized understanding of sexual difference, and analogies between concepts of race and gender were relatively new, contested, and unstable. Often, scholars did not explicitly acknowledge the mutual implications of their research on gender or race because the two strands of research were conducted separately. In particular, research on race mainly focused on men while sexual difference was seen as part of the struggles over European bourgeois gender arrangements.²⁹ The studies collected here, nevertheless, show how concepts of race and gender emerged within the same epistemic and political-cultural context and that they became systematically interlinked via reflections on reproduction. At the same time, contributions show that conceptual and political connections were loose because the concepts at stake were in the making and circulated in different fields of knowledge and because they coexisted with older views. Therefore, a critical analysis of gender and race discourses has to address the “multiplicity” of concepts.³⁰

Thus, the concept of race was not only relevant in its genealogical meaning, linking it to theories of crossbreeding and heredity, but also borrowed from the long tradition of scientific inquiry into the causes of skin color. The invention of “whiteness,” as Renato Mazzolini shows in this volume, is closely connected to this kind of research as well as to ideas of beauty and ugliness within the widely circulating travel literature of the period. At the same time, the aesthetic articulation of racial hierarchies that culminated in the invention of the political phantasma of a beautiful, superior “Caucasian” race is highly gendered. As Sara Figal’s contribution shows, the fascination with the Caucasus and the Caucasian people was not only due to a reappropriation of ancient mythology and the biblical story of the landing of Noah’s Ark on Mount Ararat, but above all draws on eroticized reports of the beauty of Circassian women, especially female slaves. Here, the phantasmagoric dimensions of concepts of race and their articulation with erotic desire and gender politics are obvious. It also becomes clear in how closely the invention of racial hierarchies is intertwined with the issue of slavery. However, it is not only the economics and politics of slavery and abolitionism that fueled racial discourse. In the eighteenth century, “slavery” had become a general signifier for oppression, domination, and nonfreedom.³¹ Slavery thus also functioned

as a political metaphor, which, for example in the rhetoric of Mary Wollstonecraft,³² evoked analogies between women's oppression and the oppression of slaves. Despite the attempts to define *race*—as in Kant's work—the concept thus frays and blurs. It crosses different fields of knowledge and discourses and simultaneously connects them.

A similar process can also be seen in ideas about propagation. The different terms that designate these processes—*procreation*, *generation*, *reproduction*, *regeneration*, or *degeneration*—are all used in new, previously unthought-of ways, and their meanings shift further as they are introduced into new domains. In the wake of new scientific, social, and political uncertainties about the meanings, status, and cultural relevance of lineage and kinship relations, a kind of genealogical anxiety manifests itself in the decades around 1800.

In these years, relations of reproduction—the social relations and arrangements that regulate the “making” of children and conceptualizations of reproduction—underwent far-reaching change. In particular, the success of epigenesis has to be seen in this context. It was, at least partly, due to the fact that epigenesis was compatible with the new ideas and practices of free-choice marriage and romantic love. In contrast to preformationism, according to which the choice of a specific “generative partner” was insignificant, within an “epigenetic framework . . . there is always an ‘alternative,’” opening up the possibility of a free choice for “those partners who desire to ‘mix.’”³³ The theoretical debates on procreation and generation thus clearly contributed to new understandings of marriage, love, and gender relations in the late eighteenth- and early nineteenth centuries.³⁴ However, within these theories, different stances on the function and status of the sexes coexisted so that these theories seem to have been a medium within which divergent ideas about gender and gender equality were contested.

To sum up, the philosophical and scientific debates that contributed to the formation of the early life sciences evoke and are situated in various social and cultural contexts—contexts that are to some extent interconnected, but cannot be homogenized. From the present day point of view, studying the early life sciences and their political-ethical dimensions and contexts, and especially studying concepts of race, gender, and reproduction, is of particular interest because the historical distance that separates us from these configurations allows to trace out both continuities and discontinuities. The contributions to this volume indicate that the texts and debates of the late eighteenth and early nineteenth centuries elude the idea of biopolitics as a unified paradigm that emerged during this period and which has shaped modernity since

then. Moreover, these analyses contribute to a more complex understanding of epistemic processes that fed the formation of biology and biopolitical discourse.

The first section of the book focuses on the importance of theories and concepts of procreation, generation, and reproduction for the emergence of the life sciences. Contributions of this section scrutinize the various articulations and the cultural contexts in which they circulated. Susanne Lettow opens this section with an analysis of the emergence and circulation of the concept of reproduction from the mid-eighteenth century to German *Naturphilosophie*. Lettow argues that up to the end of the century, the concept of reproduction became more and more invested with cosmological ideas about continuity and individuals' belonging to supra-individual entities like the species, sex, or race. Whereas authors like LaMettrie, Maupertuis, and Buffon or Blumenbach, Herder, and Kielmeyer dealt with heterogeneous models of temporality that at least partly acknowledged temporal change and an open future, in the *Naturphilosophie* of Schelling, Görres, and Hegel, the understanding of time became restricted, homogenized, and mythologized. This, in Lettow's view, contributed to the emergence of a biopolitical gaze.

Florence Vienne's chapter focuses on research on spermatic animals between 1749 and 1805; that is, between the publication of Buffon's *Histoire naturelle* and Lorenz Oken's *Die Zeugung*. By comparing different understandings of the reproductive substance as organic molecules, parasites, or *Urthiere*, Vienne shows how the different theories were all permeated by assumptions about gender relations. She argues that the still-current idea of sperm as characterized by motility and vitality originates from these debates, particularly in the dualistic construction of gender that obsessed Romantic *Naturphilosophen* like Oken.

Both Lettow's and Vienne's accounts accord with Peter Hanns Reill's claim that, by the end of the century, scientific constructions of gender and a hierarchical, polarized understanding of gender difference increasingly replaced earlier conceptualizations of gender that highlighted ambiguity and the interaction between differences. Reill's chapter analyzes the articulations of gender difference in the theories of generation formulated by Wilhelm von Humboldt, Lorenz Oken, and Carl Gustav Carus. Humboldt, who was fascinated by androgyny and "strong" women in both the mental and physical sense, conceived of two forces—both active although different—that worked together in generation. But the Romantic *Naturphilosophen* some years later transformed difference into a hierarchical polarization. Reill argues that the "blurring of boundaries and the transmutation of gender categories" of the

late Enlightenment became more and more closely identified with the turmoil and uncertainties resulting from the French Revolution. The *Naturphilosophen* yearned instead for “order, clarity, and hierarchy.” The gender constructions of Oken and Carus are particularly striking examples of this obsession with clear separations between the sexes and with the devaluation of women, who came to be equated with “the fish” or “the plant,” and thus with the lower principles of living nature.

All these debates were part of a broad cultural concern with procreation and generation. Not only did scientific ideas about the reproductive process and the materials involved in it change, but the concepts of procreation and generation themselves were deployed in new ways. Jocelyn Holland inquires into the new meanings acquired by the terms *Zeugung* (procreation) and *Fortpflanzung* (generation) within the German intellectual community. Although the concepts were not clearly distinguished and often used interchangeably, *Fortpflanzung* and *Zeugung* are, as Holland shows, “indebted to different points of departure and serve different purposes.” Whereas *Zeugung* mainly refers to singular acts of producing a new individual, *Fortpflanzung* is articulated with notions of temporal expansion and duration. Pointing to Goethe, Herder, and Fichte, Holland argues that *Fortpflanzung* tends to be construed as a virtual medium within which the real acts of procreation happen. This understanding of *Fortpflanzung* is not limited to the organic realm but extends into, for example, Ritter’s theories of chemistry and acoustics. Here, the “virtualization” of propagation becomes a central discursive operation. The debates Holland reconstructs are dispersed and relate to different fields of knowledge, but appear to have influenced nineteenth-century biology. In her chapter on Gottfried Reinhold Treviranus, one of the authors who invented the term *biology*, Joan Steigerwald shows how the initial outlines of this new science resulted from an amalgamation of earlier debates and developments. Treviranus, Steigerwald argues, was neither an original thinker nor an innovative researcher, but his “mixture of approaches” made the six volumes of *Biology, or Philosophy of Living Nature for Natural Researchers and Physicians* (*Biologie, oder Philosophie der lebenden Natur für Naturforscher und Ärzte*), which appeared between 1814 and 1822, an “ambiguous prototype for a new science of life.” The notion of “bios,” or “life,” which was the conceptual core absorbing these different approaches, was as Steigerwald points out, shaped by a peculiar interest in the boundaries and border zones of life, especially in those living beings that Treviranus called *animal-plants* or *plant-animals*. This interest led him to highlight not only “the regularity and organization” of living beings but also their contingent and deviant aspects, thus not only manners of generation but also of degeneration. Although

Treviranus's sketch of biology dismissed the political-ethical dimensions that helped to shape this field of knowledge, he incorporated much from the earlier debates on reproduction, gender, and race.

The second part of the volume shows how concepts of race and gender were articulated within the context of the early life sciences, how they resonated with each other, and how they circulated in the scientific, philosophical, and political-ethical debates of the period. Although gender and race were linked through ideas of crossbreeding and heredity, the meaning of these concepts was by no means confined to the life sciences. Moreover, modern gender and race discourses have to be understood as amalgamations of scientific, political, aesthetic, and phantasmatic elements.

Renato Mazzolini reconstructs the history of skin-color research from the mid-seventeenth to the mid-nineteenth century. He argues that the classifications built on this research, which focused solely on "black" skin, preceded concepts of race and modern racism. They were deeply influenced by the perception of Africans that emerged in the context of the system of color-based slavery introduced by the Europeans in the early sixteenth century. However, the political implications of these classificatory differences were highly disputed. Whereas many earlier researchers contested justifications of the subjugation of Africans by presenting "natural" explanations for differences in skin color, toward the turn of the eighteenth to the nineteenth century, these differences were increasingly equated with aesthetic and intellectual distinctions and hierarchies. In this period, too, the idea that Europeans also have a skin color—white—first emerged.

Sara Figal's contribution shows that the invention of whiteness and the European Caucasian race also was a highly imaginative and phantasmagoric process. Figal examines the figure of the female Circassian slave, which stood at the center of race theories, specifically in narratives about the superior Caucasian race. As Figal argues, this figure points to the highly ambivalent, hybrid status of white European identity because it locates the origin of that identity outside the cultures considered "civilized" and outside of orthodox Christendom; in other words, in a world that, according to travel writers of the time, was populated by "animist heathens with vestiges of Christian and Muslim influence" (Figal, in this volume). In addition, the fascination that captured writers such as Bernier or John Chardin was highly invested with erotic desire and Orientalist fantasies about the "female harem slave." However, it was not only "eroticized exoticism" that made the beautiful Circassian an icon of racial theories, but also proto-eugenic fantasies and reflections on crossbreeding; that is, on the improvement of blood and beauty through reproducing with Circassian or Georgian women.

A different entanglement of gender politics and racial discourse is analyzed by Penelope Deutscher, who scrutinizes Mary Wollstonecraft's feminist rhetoric. Deutscher points out how Wollstonecraft's *Vindication of the Rights of Women*, published in 1792 at the height of parliamentary debates on slavery, is pervaded by a set of analogies among slaves, animals, and women. Some of these analogies, especially the analogy between the slave and the animal as subjected to the cruel behavior of European men, had already circulated in other feminist and abolitionist writings like those of Catherine Macaulay or Olaudah Equiano. Only in Wollstonecraft, however, are these analogies entirely deprived of literal meaning, unfolding instead a complex interplay of "analogies of analogies." Although Wollstonecraft seems, at least partly, to be conscious of the metaphorical use she makes of figures like the animal or the slave to decry women's oppression, she cannot reflect on the "rhetorical profit" she gains from these analogies. As Deutscher argues, to qualify the subordination of women as abhorrent because it degrades them to the status of slaves also means implicitly to reiterate the subordination of slaves, even if Wollstonecraft was highly critical of slavery.

From the perspective of the history of science, Kant's definition of race through heredity surely was a crucial moment in the modern history of the concept. Staffan Müller-Wille, however, in his chapter on race, heredity, and disease introduces a *longue durée* perspective on these interrelated phenomena. He argues that, far from being an essentialist concept built on the idea of an unchangeable set of fixed traits, the modern concept of race arose from thinking about hereditary variation so that "deviation" is part of its core meaning. This idea of deviation, Müller-Wille writes, can be traced back to early-modern research and reflections on hereditary diseases. Thus, although the concepts of race and heredity surfaced in the years around 1800, their history extends in both directions: into the past and into our own time, where racial categories are reappearing in the context of genomics and biomedicine.

Robert Bernasconi also addresses the relationship of race and heredity. He focuses on the debates of the 1790s with particular attention to the contributions of Kant, Girtanner, and Schelling. He starts from the seeming paradox that Kant's concept of race, widely adopted among philosophers and naturalists by the end of the century, was linked to a preformationist concept, namely that of germs. Bernasconi shows that Kant's notion of germs was complex and that he developed a specific position called *generic preformationism* that allowed him to reconcile elements from epigenesis and preformationism. The epigenetic orientation Kant laid out in the *Critique of*

Judgment thus did not contradict his earlier position formulated in the race essays because Kant never fully abandoned the notion of germs. The wide circulation of Kant's concept of race, largely through the writings of Girtanner and Schelling, underlines Bernasconi's argument that the *Critique of Judgment* and the adaptation of Blumenbach's *Bildungstrieb* were anything but a "graveyard" for the concept of race.

Schelling, however, did not only contribute to the circulation of the Kantian concept of race. Like Hegel—although within a different philosophical framework—he proposed a notion of reproduction marked by sexual polarity. As Alison Stone shows, Schelling deploys the idea of two opposite forces, production and inhibition, that work together in reproduction and are geared toward overcoming sexual difference for the sake of the species' unity. In Hegel, however, the main conceptual distinction is between concept and matter. Like Schelling, Hegel regards the opposition between the sexes as a prerequisite for the generation of a "third," and thus as part of an infinite dynamics, and he overtly sexualizes the distinction between concept and matter that is supposed to structure the whole of nature. This distinction also plays a major role in Hegel's theory of race. The ideas on sexual and racial difference are thus clearly connected but, Stone argues, hold a differing status in his philosophy. While the notion of sexual polarity aims (unsuccessfully) to overcome the distinction of concept and matter, racial difference "reflects the fact that the opposition . . . cannot be overcome at the level of the natural soul" (Stone, in this volume). Racial differences thus seem to be even more static than sexual difference.

Taken together, the chapters in this volume show that within the epistemic debates of the early life sciences and philosophies of nature, concepts of race and gender played a crucial role. Closely connected to ideas of crossbreeding, reproduction, and heredity, concepts of race and gender clearly resonate with each other, although meanings of race and gender disperse into various political-ethical discourses. Instead of a series of analogies among "women," "lower races," "savages," and "criminals" that were drawn in nineteenth-century discourse with reference to evolutionary biology,³⁵ we find relations of resonance. This means that concepts of race and gender correlate but are rarely parallelized or treated as analogues. To take such differences between epistemic-political constellations into account allows one to acknowledge both similarities and dissimilarities and thereby contributes to a *longue durée* analysis of the intersections of race and gender ideologies and the specific cultural status of biological knowledge in modernity. Particularly with regard to recent (re-)articulations of race and gender in the context of biomedicine and

the neurosciences, such a *longue durée* perspective can contribute to a better understanding of the cultural, political, and scientific stability of concepts of race and gender.

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NOTES

1. Although the term *gender* only acquired its contemporary, critical meaning in the context of feminist theory in the late twentieth century, I prefer—where context allows—to use the term *gender* instead of *sex* because it highlights the sociocultural implications of all concepts and ideas of sexual difference. After all, the whole sex-gender-distinction, which presupposes a clear demarcation between nature and culture, or the biological and the social does not apply to eighteenth- and early nineteenth-century materials, so that sex is always already gender. Cf. Ludmilla Jordanova, “Sex and Gender,” in *Inventing Human Science: Eighteenth-Century Domains*, ed. Christopher Fox, Roy Porter, and Robert Wokler (Berkeley, Los Angeles, London: University of California Press, 1995), 152–183.

2. I use the term *reproduction* where I refer to the neologism that was coined in the eighteenth century. *Procreation*, *generation*, and *propagation* are used in a broad rather unspecific way although distinctions between these terms were also drawn and debated in the period (see Jocelyn Holland, in this volume).
3. Cited by Giulio Barsanti, “Les phénomènes ‘étranges’ et ‘paradoxaux’ aux origines de la première révolution biologique (1740–1810),” in *Vitalisms from Haller to Cell Theory*, ed. Guido Cimino and François Duchesneau (Florence: Leo S. Olschki, 1997), 67–82, p. 67.
4. Immanuel Kant, *Critique of the Power of Judgment*, vol. 5 of *The Cambridge Edition of the Works of Immanuel Kant*, ed. Paul Guyer, trans. Paul Guyer and Edward Mathews (Cambridge: Cambridge University Press, 2000), 370, 243.
5. *Ibid.*
6. Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (London: Routledge, 1991), 232.
7. Stefani Engelstein, *Anxious Anatomy: The Conception of the Human Form in Literary and Naturalist Discourse* (Albany: State University of New York Press, 2008), 226.
8. Cf. Londa Schiebinger: *Nature’s Body: Gender in the Making of Modern Science* (New Brunswick: Rutgers University Press, 2004); Claudia Hon-egger: *Die Ordnung der Geschlechter: Die Wissenschaften vom Leben und das Weib* (Frankfurt am Main and New York: Campus, 1991).
9. Robert Bernasconi, introduction to *Bernier, Linnaeus and Maupertuis: Concepts of Race in the Eighteenth Century* (Bristol: Thoemmes Press, 2001), vol. 1:vii–xiii.
10. Immanuel Kant, “Determination of the Concept of a Human Race,” in *The Cambridge Edition of the Works of Immanuel Kant*, ed. Paul Guyer, trans. Paul Guyer and Edward Mathews (Cambridge: Cambridge University Press, 2000), vol. 8:100, 153.
11. Immanuel Kant, “Of the Different Races of Human Beings,” in *Anthropology, History, and Education*, ed. Günther Zöllner and Robert Loudon, trans. Mary Gregor, *The Cambridge Edition of the Works of Immanuel Kant*, ed. Paul Guyer and Alan W. Wood (Cambridge: Cambridge University Press, 2007), vol. 2:85.
12. Staffan Müller-Wille and Hans-Jörg Rheinberger, “Heredity—the Formation of an Epistemic Space,” in *Heredity Produced: At the Crossroads of Biology, Politics, and Culture, 1500–1870*, ed. Staffan Müller-Wille and Hans-Jörg Rheinberger (Cambridge, MA: MIT Press, 2007), 3–34, 18.

13. See Staffan Müller-Wille in this volume.
14. Cf. Ute Frevert, *"Mann und Weib, und Weib und Mann."* *Geschlechter-Differenzen in der Moderne* (München: C. H. Beck, 1995).
15. See Peter Hanns Reill: *Vitalizing Nature in the Enlightenment* (Berkeley, Los Angeles, London: University of California Press, 2005).
16. On preformationist theories, criticism of them, and the ideas of gender difference evoked in the debates, see Florence Vienne in this volume. Cf.: Shirley Roe, *Matter, Life and Generation. Eighteenth-Century Embryology and the Haller-Wolff-Debate* (Cambridge: Cambridge University Press, 1981); Clara Pinto-Correia, *The Ovary of Eve: Egg, and Sperm and Preformation* (Chicago: University of Chicago Press, 1997).
17. Peter McLaughlin, "Blumenbach und der Bildungstrieb: Zum Verhältnis von epigenetischer Embryologie und typologischem Artbegriff," *Medizinhistorisches Journal* 17 (1982):357–372, 358. My translation.
18. Friedrich Wilhelm Joseph Schelling, *First Outline of a System of the Philosophy of Nature*, trans. Keith R. Peterson (Albany: State University of New York Press, 2004), 36.
19. Thomas Laqueur has argued that during the eighteenth century the older one-sex model, according to which female bodies were conceived as default or minor versions of the male body was replaced by a two-sex model that highlights sexual dimorphism. His historical analysis, however, has been criticized for being too one-dimensional. Cf. for example Katherine Park, "Cadden, Laqueur and the 'One-Sex-Body,'" *Medieval Feminist Forum* 46, 1 (2010):96–100.
20. Dietrich von Engelhardt, *Hegel und die Chemie: Studie zu Philosophie und Wissenschaft um 1800* (Wiesbaden: Guido Pressler, 1976), 1. My translation.
21. Nicholas Jardine, "Naturphilosophie and the Kingdoms of Nature," in *Cultures of Natural History*, ed. Nicholas Jardine, James A. Secord, and Emma Spary (Cambridge: Cambridge University Press, 1996), 230–245, 243–244.
22. Randall Collins, "The Transformation of Philosophy," in *The Rise of the Social Sciences and the Formation of Modernity: Conceptual Change in Context, 1750–1850*, ed. Björn Wittrock, Johan Heilbron, and Lars Magnusson (Dordrecht: Kluwer, 1998), 141–161, 147.
23. Randall Collins, "The Transformation of Philosophy," 150. The most prominent contribution to this development was probably Kant's *Der Streit der Fakultäten* (The dispute of faculties), published in 1798.

24. On the persistence of race categories, see Müller-Wille in this volume; also Sander Gilman, *Diseases and Diagnoses: The Second Age of Biology* (New Brunswick: Transaction, 2010); Nicole Karafyllis and Gotlind Ulshöfer, eds., *Sexualized Brains: Scientific Modeling of Emotional Intelligence from a Cultural Perspective* (Cambridge, MA: MIT Press, 2010).
25. See Lorraine Daston and Fernando Vidal, "Introduction: Doing What Comes Naturally," in *The Moral Authority of Nature*, ed. Lorraine Daston and Fernando Vidal (Chicago: University of Chicago Press, 2003), 1–20.
26. Lorraine Daston, "The Naturalized Female Intellect," *Science in Context* 5 (1992):209–235, 210.
27. Emma Spary, "The 'Nature' of Enlightenment," in *The Sciences in Enlightened Europe*, ed. William Clark, Jan Golinski, and Simon Schaffer (Chicago: University of Chicago Press, 1999), 272–304, 296.
28. See Nancy Leys Stepan, "Race and Gender: The Role of Analogy in Science," *Isis* 287 (1986):261–277.
29. Londa Schiebinger, *Nature's Body*, chapter 5 "Theories of Gender and Race," 143–183.
30. As Roxann Wheeler argues, "an awareness of multiplicity is based on the premise that in historical terms, ideologies and practices do not disappear; rather they coexist with new ways of thinking and living, are revised partially to fit new conditions, or 'go underground' for a while and resurface later." In addition, "a theory of multiplicity also acknowledges the various components of racial ideology. . . . A focus on the elasticity of race . . . is not to say that it was unconstrained, but its articulation was far more heterogeneous than is usually conceded today." See Roxann Wheeler, *The Complexion of Race: Categories of Difference in Eighteenth-Century British Culture* (Philadelphia: University of Pennsylvania Press, 2000), 39.
31. See Susan Buck-Morss, *Hegel, Haiti, and Universal History* (University of Pittsburgh Press, 2009).
32. See Penelope Deutscher in this volume.
33. Helmut Müller-Sievers, *Self-Generation: Biology, Philosophy and Literature Around 1800* (Stanford: Stanford University Press, 1997), 30.
34. For an analysis of the cultural concern with love and marriage in the period see Adrian Daub, *Uncivil Unions: The Metaphysics of Marriage in German Idealism and Romanticism* (Chicago: University of Chicago Press, 2012).
35. See Nancy Leys Stepan, "Race and Gender."